

REMARKS/ARGUMENTS

Applicants would like to thank the Examiner for the careful consideration given the present application. The application has been carefully reviewed in light of the Office Action. Favorable reconsideration of the application is requested in view of the remarks and amendments made herein.

Claims 1–2 and 11 were rejected under 35 U.S.C. 103(a) as being unpatentable over Kurosawa (U.S. Patent No. 6,709,543) in view of either Odajima et al. (U.S. Patent Publication 2001/0029088) or Tsujimoto (U.S. Patent Publication 2003/0070517). Traversal of this rejection is made for at least the following reasons. First, the references teach away from such a combination, as the prior art would be rendered unsatisfactory for its intended purpose. MPEP 2143.01. In the present case, the examiner proposes to combine Kurosawa with either Odajima et al. or Tsujimoto. Kurosawa is directed to a separation method using thrust pins and a vacuum source; while both Odajima and Tsujimoto use peeling operations. There is no peeling operation in Kurosawa. Further, Odajima expressly discourages *teaches away* from the thrust pin and vacuum methods disclosed in Kurosawa in favor of the peeling methods disclosed in Odajima and Tsujimoto.

Even if the cited references could be combined, the cited references fail to show or suggest claim 1. For example, claim 1 requires that the semiconductor chip adhered to the sheet is bent and deformed only by the vacuum suction force so as to exfoliate the sheet from the semiconductor chip. Neither Odajima nor Tsujimoto discloses a vacuum source that bends and deforms a semiconductor chip adhered to a sheet. Kurosawa also does not disclose the above-cited configuration. For instance, Kurosawa requires a thrust pin 24a to exfoliate the chip from the sheet as opposed to a vacuum source. Accordingly, Applicant respectfully requests that claim 1 be placed in condition for allowance.

In addition, claims 1 and 11 are currently amended to recite the limitation of “wherein

when the vacuum-sucking is performed, the sheet is bent toward a source of the vacuum suction from a flat plane in which the sheet is abutted against the suction surface of the exfoliation mechanism.” This amendment is fully supported in the specification and is shown in at least FIGS. 6B and 6C. None of the cited references disclose or suggest this limitation. For example, in Kurosawa, the sheet 22 is pushed upwardly by the thrust pins from the beginning of the sheet exfoliating process, as shown in FIG. 12. Further, Kurosawa discloses that the sheet is exfoliated from a lower surface of the semiconductor chip by the upward action of the thrust pins, as opposed to using only the vacuum suction force, as required by claims 1 and 11. The cited section of Kurosawa (column 17, lines 13-27 and 35-45) states:

at the time of separation of the semiconductor chip 1 from the adhesive sheet 22, the corner portions are first separated by the first thrust pin group 24a and then the nearby portion of the central portion is separated by the second thrust pin group 24b... Further, the semiconductor chip 1 is separated by use of a large number of thrust pins of the groups 24a, 24b... (emphasis added).

There is no mention in this embodiment of Kurosawa of the use of vacuum suction to either bend or deform the semiconductor chip or to exfoliate the sheet from a lower surface of the chip, as required by claims 1 and 11. In fact, in each of the embodiments of Kurosawa that discloses using a vacuum suction force, the semiconductor chips are significantly thicker and do not bend at all. See, for example, Figs. 12, 14, 16, and 22. Note that in the Figures of Kurosawa there appear to be semiconductor chips of two distinct thicknesses. The thin chips are shown in Figs. 3A-10A, 18A-21A, and 26A-29A; while the thick chips are shown in Figs. 1, 12, 14, 16, and 22. Only the thin chips are shown as being bent and deformed during the exfoliation process but only the thick chips are shown as being used with a vacuum suction force. Moreover, Kurosawa states that “the semiconductor chip 1 can be effectively suppressed from being bent when the semiconductor chip 1

which is made thin is separated.” Col. 17, lines 35-39. Therefore, Kurosawa does not disclose the limitations provided in the amendment. Furthermore, Odajima does not disclose or suggest using a vacuum or a suction step in the manner recited in claim 1. In addition, Tsujimoto does not disclose a vacuum or a suction step. For at least the reasons discussed above, the combination of Kurosawa and either Odajima or Tsujimoto does not disclose, teach, or suggest each and every limitation as set forth in claims 1, 2, and 11. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 1-2 and 5-11 were rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2001-118862 (Akira) in view of U.S. 6,709,543 (Kurosawa) and either U.S. 2001/0029088 (Odajima et al.) or U.S. 2003/0070517 (Tsujimoto). Traversal of this rejection is made for at least the following reasons. As stated above, the combination of Kurosawa and either Odajima or Tsujimoto is improper as Kurosawa is directed to a separation method using thrust pins and a vacuum source; while both Odajima and Tsujimoto use peeling operations. Further, Odajima expressly discourages teaches away from the thrust pin and vacuum methods disclosed in Kurosawa in favor of the peeling methods disclosed in Odajima and Tsujimoto. Akira does not make up for the deficiencies of Kurosawa. Here, the examiner concedes that Akira fails to show the semiconductor chip being bent, as stated on page 4 of the Office action, and thus relies on Kurosawa in an attempt to disclose this limitation. However, as stated above, Kurosawa fails to disclose that the semiconductor chip is bent by use of the vacuum suction force alone. Instead, Kurosawa only discloses that the semiconductor chip can be bent by an upward force of the thrust pins.

In addition, claims 5 and 10 are currently amended to recite the limitation of “wherein the boundary portion is arranged in a same flat plane as the suction surface so that the sheet is bent toward a source of the vacuum sucking from the flat plane.” This amendment is fully supported in

the specification and is shown in at least FIGS. 6B and 6C. This amendment is similar to the amendment of claims 1 and 11, as described above. For at least the same reasons as claims 1 and 11, it is believed that claims 5 and 10 are not disclosed or suggested by the cited references.

For at least these reasons, the combination of Akira, Kurosawa, and either Odajima or Tsujimoto cannot render obvious claims 5-10. Withdrawal of this rejection is respectfully requested.

In light of the foregoing, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in a condition for allowance, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 16-0820, our Order No. NGB-35857.

Respectfully submitted,
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Date: September 22, 2008